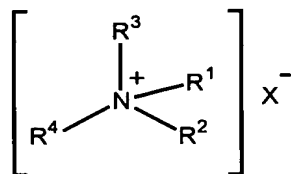


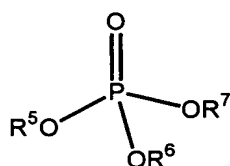
Claims

1. A composition, comprising:
a quaternary ammonium compound of formula (I)



(I); and

a phosphate ester of formula (II);



(II);

wherein R¹, R², R³, R⁴ are independently a hydrocarbyl group;
X is selected from the group consisting of halide and sulfate;

and

R⁵, R⁶, and R⁷ are independently selected from the group
consisting of hydrogen, a hydrocarbyl group, and a polyoxyalkylated alcohol.

2. The composition of claim 1, wherein R¹ and R² contain from 1 to 6 carbon atoms; and R³ and R⁴ contain from 7 to 20 carbon atoms.

3. The composition of claim 1, wherein R¹ and R² contain from 1 to 5 carbon atoms; and R³ and R⁴ contain from 7 to 15 carbon atoms.

4. The composition of claim 1, wherein R¹ and R² contain from 1 to 3 carbon atoms; and R³ and R⁴ contain from 8 to 12 carbon atoms.

5. The composition of claim 1, wherein R¹ and R² are decyl; and R³ and R⁴ are methyl.

6. The composition of claim 5, wherein X is a halide.

7. The composition of claim 5, wherein X is chloride.

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8. The composition of claim 1, wherein R^5 is a polyoxyalkylated alcohol of from 2 to 500 carbon atoms.

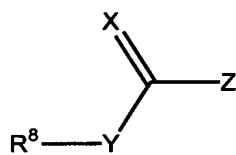
9. The composition of claim 8, wherein the polyoxyalkylated alcohol comprises an alcohol portion of from 1 to 20 carbon atoms.

5 10. The composition of claim 8, wherein the polyoxyalkylated alcohol comprises an alcohol portion of from 6 to 14 carbon atoms.

11. The composition of claim 8, wherein R^6 and R^7 are hydrogen.

12. The composition of claim 1, wherein the phosphate ester is poly(oxy-1,2-ethandiyl) tridecyl hydroxy phosphate.

10 13. The composition of claim 1, further comprising a thiocarbonyl compound of formula (III)



(III);

wherein R^8 is selected from the group consisting of metal ion, ammonium ion, hydrocarbyl, and heterohydrocarbyl;

15 X and Y are independently selected from the group consisting of oxygen and sulfur;

Z is selected from the group consisting of OR^9 and $NR^{10}R^{11}$; and R^9 , R^{10} , and R^{11} are independently selected from the group consisting of hydrocarbyl and heterohydrocarbyl.

20 14. The composition of claim 13, wherein X is sulfur.

15. The composition of claim 14, wherein Z is $NR^{10}R^{11}$.

16. The composition of claim 15, wherein R^{10} and R^{11} are independently hydrocarbyl groups of from 1 to 10 carbon atoms.

17. The composition of claim 15, wherein R^{10} and R^{11} are independently hydrocarbyl groups of from 1 to 5 carbon atoms.

18. The composition of claim 16, wherein Y is sulfur.

19. The composition of claim 18, wherein R^8 is a metal ion.

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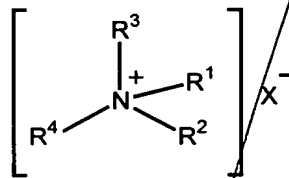
20. The composition of claim 13, wherein the thiocarbonyl compound is potassium dimethyl dithiocarbamate.

21. The composition of claim 1, further comprising a solvent.

22. The composition of claim 1, further comprising at least one additive selected from the group consisting of a supplemental corrosion inhibitor, a scale inhibitor, a surfactant, a biocide, a foamer, and an oxygen scavenger.

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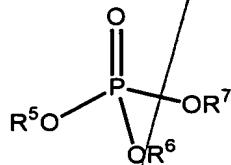
23. A composition, comprising:
a quaternary ammonium compound of formula (I)



(I);

wherein R^1 , R^2 , R^3 , R^4 are independently a hydrocarbyl group;

a phosphate ester of formula (II);



(II);

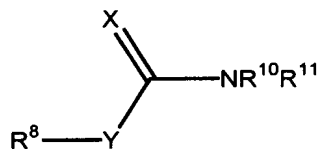
wherein X is selected from the group consisting of halide and sulfate; and

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R⁵, R⁶, and R⁷ are independently selected from the group consisting of hydrogen, a hydrocarbyl group, and a polyoxyalkylated alcohol; and

a thiocarbonyl compound of formula (III);



(III);

wherein R⁸ is selected from the group consisting of metal ion, ammonium ion, hydrocarbyl, and heterohydrocarbyl;

X and Y are selected from the group consisting of oxygen and sulfur, such that at least one of X and Y is sulfur; and

R¹⁰ and R¹¹ are independently selected from the group consisting of hydrocarbyl and heterohydrocarbyl.

24. The composition of claim 23, wherein

R¹ and R² are independently a hydrocarbyl group of from 1 to 6 carbon atoms;

R³ and R⁴ are independently a hydrocarbyl group of from 7 to 20 carbon atoms;

R⁵ is a polyoxyalkylated alcohol of from 2 to 500 carbon atoms;

R⁶ and R⁷ are independently hydrogen or a hydrocarbyl group of from 1 to 20 carbon atoms;

X is sulfur; and

R¹⁰ and R¹¹ are independently hydrocarbyl groups of from 1 to 10 carbon atoms.

25. The composition of claim 23, wherein the quaternary ammonium compound is didecyl dimethyl ammonium chloride; the phosphate ester is poly(oxy-1,2-ethandiyl)tridecyl hydroxy phosphate; and the thiocarbonyl compound is potassium dimethyl dithiocarbamate.

26. The composition of claim 23, further comprising a solvent.

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27. The composition of claim 26, further comprising at least one additive selected from the group consisting of a supplemental corrosion inhibitor, a scale inhibitor, a surfactant, a biocide, a foamer, and an oxygen scavenger.

5 28. The composition of claim 27, wherein
weight;
the quaternary ammonium compound is present at 1-95% by
the phosphate ester is present at 0-95% by weight;
10 the thiocarbonyl compound is present at 0-95% by weight;
the solvent is present at 5-95% by weight; and
the at least one additive is present at 0-95% by weight.

15 29. The composition of claim 27, wherein
weight;
the quaternary ammonium compound is present at 1-50% by
the phosphate ester is present at 1-50% by weight;
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a'7 the thiocarbonyl compound is present at 0-50% by weight;
the solvent is present at 20-80% by weight; and
the at least one additive is present at 0-50% by weight.

20 30. The composition of claim 27, wherein
weight;
the quaternary ammonium compound is present at 1-20% by
the phosphate ester is present at 1-20% by weight;
25 the thiocarbonyl compound is present at 1-20% by weight;
the solvent is present at 50-75% by weight; and
the at least one additive is present at 0-20% by weight.

31. The composition of claim 27, wherein the quaternary ammonium compound, the phosphate ester, and the thiocarbonyl compound are present at a 1:1:1 ratio by volume.

32. A method of inhibiting corrosion of iron and ferrous base materials, comprising:

contacting a material with the composition of claim 1.

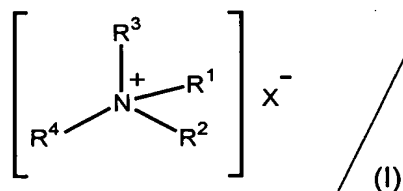
33. A method of inhibiting corrosion of iron and ferrous base materials, comprising:

contacting a material with the composition of claim 23.

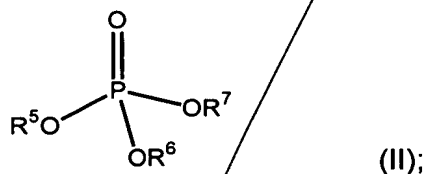
34. A method of inhibiting corrosion of iron and ferrous base materials, comprising:

contacting a material with the composition of claim 25.

35. A method of making a corrosion inhibitor, comprising combining a quaternary ammonium compound of formula (I)



with a phosphate ester of formula (II)



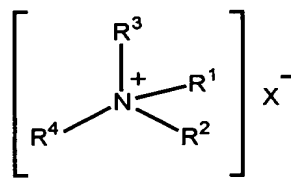
wherein R^1, R^2, R^3, R^4 are independently a hydrocarbyl group;

X is selected from the group consisting of halide and sulfate; and

R^5, R^6 , and R^7 are independently selected from the group consisting of hydrogen, a hydrocarbyl group, and a polyoxyalkylated alcohol.

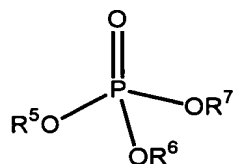
36. A method of making a corrosion inhibitor, comprising combining a quaternary ammonium compound of formula (I)

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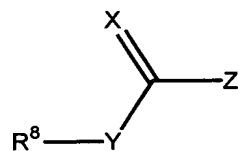
(I)

with a phosphate ester of formula (II)



(II)

and further with a thiocarbonyl compound of formula (III)



(III);

wherein R^8 is selected from the group consisting of metal ion, ammonium ion, hydrocarbyl, and heterohydrocarbyl;

X and Y are independently selected from the group consisting of oxygen and sulfur;

Z is selected from the group consisting of OR^9 and $NR^{10}R^{11}$; and

R^9 , R^{10} , and R^{11} are independently selected from the group consisting of hydrocarbyl and heterohydrocarbyl.

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